

WHAT IS CLAIMED IS:

1. A signal embodied in a carrier wave for sending information  
5 from transmit stations to receive stations over a transmission medium of a frame-based based communications network, the information being sent in transmit frames having a frame format comprising a fixed rate header, followed by a variable rate payload, followed by a fixed rate trailer.
- 10 2. The signal of Claim 1, wherein the fixed rate header includes:
  - a preamble;
  - a frame control field;
  - 15 a destination address field;
  - a source address field; and
  - an ethertype field.
3. The signal of Claim 2, wherein the preamble includes a  
20 repetition of four symbol sequences for facilitating power estimation, gain control, baud frequency offset estimation, equalizer training, carrier sensing and collision detection.
4. The signal of Claim 2, wherein the frame control field  
25 includes scrambler control information for frame scrambling initialization.
5. The signal of Claim 2, wherein the frame control field includes a priority field to determine the absolute priority a  
30 transmit frame will have when determining access to the transmission medium.
6. The signal of Claim 2, wherein the frame control field includes a payload encoding field which determines constellation  
35 encoding of payload bits in the variable rate payload.

7. The signal of Claim 2, wherein the frame control field includes a header check sequence for providing a cyclic  
5 redundancy check.

8. The signal of Claim 1, wherein the variable rate payload is transmitted pursuant to dynamic adjustable frame encoding parameters for improving transmission performance for a transmit  
10 frame being transmitted from a transmitting station to a receiving station.

9. A signal embodied in a carrier wave for sending informatin from transmit stations to receive stations over a transmission  
15 medium of a frame-based based communications network, the information being sent in transmit frames having a frame format comprising:

a fixed rate header;  
a variable rate payload following the fixed rate header; and  
20 a fixed rate trailer following the variable rate payload;  
wherein the fixed rate header includes:

a preamble, the preamble including a repetition of four symbol sequences for facilitating power estimation, gain control, baud frequency offset estimation, equalizer training, carrier  
25 sensing and collision detection;

a frame control field, the frame control field including:

scrambler control information for frame scrambling initialization,

30 a priority field to determine the absolute priority a transmit frame will have when determining access to the transmission medium,

a payload encoding field which determines constellation encoding of payload bits in the variable rate  
35 payload, and

a header check sequence for providing a cyclic redundancy check;

- 5 a destination address field;  
a source address field; and  
an ethertype field; and

wherein the variable rate payload is transmitted pursuant to dynamic adjustable frame encoding parameters for improving  
10 transmission performance for a transmit frame being transmitted from a transmitting station to a receiving station.

10. A method for transmitting a transmitting frame embodied in a carrier wave from transmit stations to receive stations over  
15 a transmission medium of a frame-based based communications network, comprising:

coupling one or more transmit stations to the transmission medium, each transmit station transmitting frames having a frame format including a fixed rate header, followed by a variable rate  
20 payload, followed by a fixed rate trailer;

coupling one or more receive stations to the transmission medium, each receive station upon receiving a received frame corresponding to the transmitting frame addressed to the receive station:

25 detecting a start of the received frame utilizing a predefined preamble format for the transmitting frame having a plurality of identical copies of a preamble symbol sequence transmitted sequentially;

decoding the received frame;  
30 measuring and tracking performance of frame decoding;  
determining network performance characteristics for establishing desired performance based upon measuring and tracking the performance of the frame decoding;

indicating to the transmit station changes to payload  
35 encoding parameters in the fixed rate header based upon

determining network performance improvement characteristics,  
wherein the transmit station changes the payload encoding  
5 parameters in the fixed rate header for encoding next future  
transmitting frames; and

determining whether a collision between two or more  
transmit stations occurred at one of the transmit stations  
utilizing an estimate of error power of defined copies of the  
10 preamble symbol sequence.

11. The method of Claim 10, wherein the fixed rate header  
includes:

a preamble, the preamble including a repetition of four  
15 symbol sequences for facilitating power estimation, gain control,  
baud frequency offset estimation, equalizer training, carrier  
sensing and collision detection;

a frame control field, the frame control field  
including:

20 scrambler control information for frame scrambling  
initialization,

a priority field to determine the absolute  
priority a transmitting frame will have when determining access  
to the transmission medium,

25 a payload encoding field which determines  
constellation encoding of payload bits in the variable rate  
payload, and

a header check sequence for providing a cyclic  
redundancy check;

30 a destination address field;

a source address field; and

an ethernet type field; and

wherein the variable rate payload is transmitted pursuant  
to dynamic adjustable frame encoding parameters for improving  
35 transmission performance for a transmitting frame being  
transmitted from a transmitting station to a receiving station.